

Honors Algebra 2B

Final Exam Prep

Topics:

- Factoring
- Graph a Quadratic Function
 - vertex form
 - standard form
 - intercept form
- Solve a Quadratic Function (with both real and complex answers)
 - zero-product property
 - square-roots
 - completing the square
 - quadratic formula
- Imaginary & Complex numbers
- Solve Quadratic Inequality
- Exponents
 - integer and rational
 - simplifying radicals
- Functions
 - function versus relation
 - evaluate
 - operations (add, subtract, multiply, divide, composition)
 - domain and range
- Graph Square Roots and Cube Root Functions
- Solve Radical/Rational Exponent Equations Equations
- Probability
 - permutations
 - combinations

Example Problems

Graph the function.

1. $y = x^2 - 1$

2. $y = x^2 - 2x + 1$

3. $y = 2(x - 1)^2$

4. $y = -(x + 2)(x - 2)$

5. $y = x^2 - 2x - 3$

6. $y = \frac{1}{2}x^2 - \frac{1}{2x} - \frac{23}{8}$

7. $y = -2(x - 1)^2 + 5$

8. $y = 4(x - 2)(x - 4)$

9. $y = 2\sqrt{x}$

10. $y = -3\sqrt[3]{x}$

11. $y = 2\sqrt{x + 2} - 2$

12. $y = \frac{1}{2}\sqrt[3]{x + 3} - 1$

13. $y = -\frac{3}{2}\sqrt{x}$

14. $y = -2\sqrt{x + 3} + 1$

15. $y = -\frac{2}{3}\sqrt[3]{x}$

Factor

16. $x^2 - 49$

17. $q^2 - 11q + 24$

18. $9v^2 - 13v + 4$

19. $x^4 - 81$

20. $8x^3 - 125$

21. $18x^3 - 9x^2 - 18x + 9$

22. $x^{2n} + 3x^n - 10$

23. $2x^2 - 7x - 9$

24. $16x^3 + 250$

Solve the quadratic equation by the indicated method.

Zero-Product Property

25. $4x^2 - 6x - 18 = 0$

26. $t^2 = 6t + 55$

Square-Root

27. $3a^2 = 24$

28. $x^2 + 9 = 0$

Completing the Square

29. $x^2 - 6x + 5 = 0$

30. $x^2 - 3x + 5 = 0$

Quadratic Formula

31. $2x^2 + 6x + 5 = 0$

32. $x^2 + 9x = 10$

Simplify

33. $(7 - 4i) + (8 + 6i)$

34. $(-2 + 15i) - (8 - 3i)$

35. $(5 - i)(9 + 3i)$

$$36. \frac{6i}{1-2i}$$

$$37. \sqrt{3} \cdot 2\sqrt{3}$$

$$38. \frac{13i}{1-2i}$$

$$39. \frac{3^{\frac{2}{3}}}{3^{\frac{1}{3}}}$$

$$40. 8\sqrt{8} - 4\sqrt{18}$$

$$41. y^2 \cdot y^{\frac{3}{4}}$$

$$42. x^{15} \cdot x^{20}$$

$$43. \left(\frac{363x^{\frac{1}{6}}}{9^{\frac{1}{12}}} \right)^3$$

$$44. 3\sqrt{28} - \sqrt{63}$$

$$45. \sqrt{\frac{32x^5}{27x^3}}$$

$$46. \left(\left(\frac{2x^{\frac{11}{6}}}{x^{\frac{4}{3}}} \right)^2 \right)^3$$

$$47. \frac{6\sqrt{x^2}\sqrt{x^2}}{81\sqrt{x^{16}}}$$

Solve. Check for extraneous solutions.

$$48. 4 = \sqrt[3]{2x-8}$$

$$49. (x^2-1)^{\frac{2}{3}} + 2 = 6$$

$$50. x + 2 = \sqrt{28 - x}$$

$$51. \sqrt{3x + 5} = \sqrt{4x - 2}$$

$$53. \sqrt[3]{-8x^3} = 16$$

$$54. \sqrt{x + 13} = x + 1$$

$$55. \sqrt{4x + 5} = \sqrt{10x - 1} - 2$$

$$56. \frac{1}{2}(5x + 7)^{\frac{2}{3}} = \frac{9}{2}$$

Perform the indicated operation and state the domain.

For #s 57-59, let $f(x) = 2x^3 - 5$ and $g(x) = 3x^2$

$$57. f(x) + g(x)$$

$$58. \frac{g(x)}{f(x)}$$

$$59. f(g(x))$$

For #s 60-62, let $f(x) = x^3 - x^2$ and $g(x) = 3 - x^2$

$$60. g(x) - f(x)$$

$$61. f(x) \bullet g(x)$$

$$62. g(f(x))$$

For #s 63-65, let $f(x) = x^2 + 1$ $g(x) = -3x^{\frac{1}{3}}$ and $h(x) = x^{\frac{1}{2}}$

63. $h(x) \cdot g(x)$

64. $\frac{f(x)}{h(x)}$

65. $f(x) \cdot h(x)$

For #s 66-69, let $f(x) = 2x^2 - x$ $g(x) = x^{\frac{1}{2}}$ and $h(x) = \frac{x-1}{3}$

66. $g(h(x))$

67. $f(g(x))$

68. $h(f(x))$

Answer

69. Find the number of possible 5-card hands that contain 2 queens and 2 kings taken from a standard 52 card deck.

60. You know how to make 7 different types of cookies. You have time to make any 4 of them. How many different combinations of cookie types can you make?

61. Slips of paper with the numbers 1-50 are in a box. Find the probability of picking a number less than 15?

62. Slips of paper with the numbers 1-50 are in a box. Find the probability of picking a single digit number?

63. A certain license plate configuration has 2 letters followed by 5 digits. Assuming that digits and letters can be repeated, how many different license plates are possible?

64. You have 10 shirts, 5 pairs of pants and 3 pairs of shoes. How many different outfits can you make?

65. On his long trip to Washington, DC, Dan decides to take along 5 magazines from the 12 he recently purchased. How many different groups of magazines could Dan take on his trip?

66. Your book club will choose 12 books from 6 biographies, 8 historical novels, 12 romance novels, and 10 science fiction novels. How many different sets of exactly 3 biographies, 2 historical novels, 3 romance novels, and 3 science fiction novels can be chose?

67. What is the probability of picking from a standard deck fo 52 playing cards:

A. A red card

B. a face card

C. an ace

D. a black number card

E. two cards: one face card and one ace

F. two cards: a 2 and a king